Carnivorous plant protection project in Korea

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As all carnivorous plant lovers are aware, carnivorous plants inhabit wetlands. However, due to urban encroachment and people's neglect to the environment, wetlands are at risk. This article is written to raise awareness of how we should take initiative in protecting carnivorous plants and the wetlands they live in.

As a zealous carnivorous plant lover, I work in the Korean Carnivorous Plant Institute where mass-propagation is used to prevent extinction of carnivorous plants. Mass-propagation is the technique of taking parts of plants to mass-produce them. For instance, plants like *Utricularia bifida* L. and *Utricularia racemosa* Wall. are carnivorous plants that used to be endangered in Korea. Because mass-propagation (following the thesis written by Dr. Gi-Won Jang) was practiced, they were able to be rescued.

In order to stop the extinction of other carnivorous plants in Korea, I traveled to different wetlands to actively find and protect them. One of my meaningful journeys was to Yongneup (see Figure 1).

Figure 1: Yongneup, Mt. Daeam, South Korea.

Figure 2: Max and his father in Yongneup, taking a break after finding the carnivorous plants.

Figure 3: *Drosera rotundifolia* at Yongneup, Mt. Daeam, South Korea.

Figure 4: A red form of *Drosera rotundifolia* at Yongneup, Mt. Daeam, South Korea.

Yongneup, literally translated as "Dragon Wetland," is located in Mt. Daeam, South Korea. It is one of the wetlands included in the Ramsar List of Wetlands of International Importance (Ramsar Convention is the international treaty dedicated to protection of wetlands). Public access is strictly controlled. In fact, Yongneup is located in the DMZ (de-militarized zone) between North and South Korea. Thus, I had to obtain a permit from the government to enter the wetland to collect and mass-propagate the carnivorous plants that are unique in South Korea.

Figure 5: Max and Dr. Gi-Won Jang in the Carnivorous Plant Institute, preparing for mass-propagation.

In Yongneup, I was able to find typical plants of *Drosera rotundifolia*, and also a type of *Drosera rotundifolia* which has pink flowers and more reddish colored leaves than is typical. This species is endangered in Korea (see Figures 2-4). Even though *Drosera rotundifolia* was once prevalent in wetlands in Korea, years and years of development of wetlands eventually made it an endangered species. They are even on the verge of extinction at the protected sites in Mt. Daeam. Therefore, in order to protect and preserve the biodiversity, and with my permits from the government, in July 2010, I collected seeds from a site at approximately 38.22°N, 128.10°E, 1100 m a.s.l., and brought them back to the Carnivorous Plant Institute (see Figure 5). These details of collection location are provided with the knowledge that the site—in the DMZ—is certainly not at risk of poaching impacts.

Figure 6: Max preparing for implantation of *Drosera rotundifolia*.

Then, I mass-propagated and replanted the plants in other wetlands in Korea, near Ogok-dong and Pado-ri (see Figure 6). Dr. Gi-Won Jang and I had to carefully browse through the wetlands where these two carnivorous plants had already existed in the past and been destroyed because of urban encroachment. We selected two sites for re-introduction of live red and normal *Drosera rotundifolia* plants: Site 1 is a wetland in Bogil Island, Bogil-myeon, Wando-gun, Jelloanam-do, South Korea (34.16°N, 126.55°E; 15 m a.s.l.) and Site 2 is a wetland in Mt. Wolchul, Gaesin-ri, Yeongam-eup, Yeongam-gun, Jeollanam-do, South Korea 34.77°N, 126.71°E; 390 m a.s.l.). Such introductions must be done with great concern and responsibility. Despite the merits of being able to see carnivorous plants in nature, it is generally advised to not introduce exotic species. Planting carnivorous plants from different geographical locations can lead to genetic drift and introduction of pests and invasive species which can drastically alter the ecosystem.

While this location information exposes the plants to possible poaching risk, it is more important that future botanists encountering the plants will know that they were introduced. Furthermore, if the plants happen to spread naturally to other sites, providing explant details now will allow future scientists to analyze the spread properly.

I wish more people were aware of the importance of carnivorous plants, protect the biodiversity of wetlands, and take actions with high levels of responsibility.